Hannstar product Porduct Information

Model : TX66D11VCOCAB

Note: 1. Please contact HannStar Display Corp. before designing your product based on this module specification.

2. The information contained herein is presented merely to indicate the characteristics and performance of our products. HannStar assumes no responsibility for any intellectual property claims or other problems that may result from application based on the module described herein.

Contents

1.0 GENERAL DESCRIPTIONS

1.1 Introduction

HannStar Display model TX66D11VCOCAB is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, the voltage reference, common voltage, DC-DC converter, column, and row driver circuit. This TFT LCD has a 26-inch diagonally measured active display area with WXGA resolution (768 vertical by 1366 horizontal pixel array).

1.2 Features

- 26” WXGA TFT LCD panel
- 14 CCFLs Backlight system
- Supported WXGA (V:768 lines, H:1366 pixels) resolution
- With LCD Timing Controller
- With inverter

1.3 Applications

- Desktop monitors
- Display terminals for AV applications
- Monitors for industrial applications

1.4 General information

Item		Specification	Unit
Outline dimension		646x373x50.5 (typ.)	mm
Display area		581.77(H) x 329.71(V) (26.0” diagonal)	mm
Number of Pixel		1366(H) x 768(V)	Pixels
Pixel pitch		0.4215(H) x 0.4215(V)	mm
Pixel arrangement		BGR Vertical stripe	
Display color		16.7 million (8 bit)	colors
Display mode		Normally Black	
Surface treatment		Antiglare, Hard-Coating (3H)	
Weight(With Inverter)		6000(g)(Typ.)	g
Back-light		14-CCFLs	
Input signal		1-ch LVDS	
Power consumption	Logic system	(TBD)	W
	B/L system	(TBD)	W

1.5 Mechanical Information

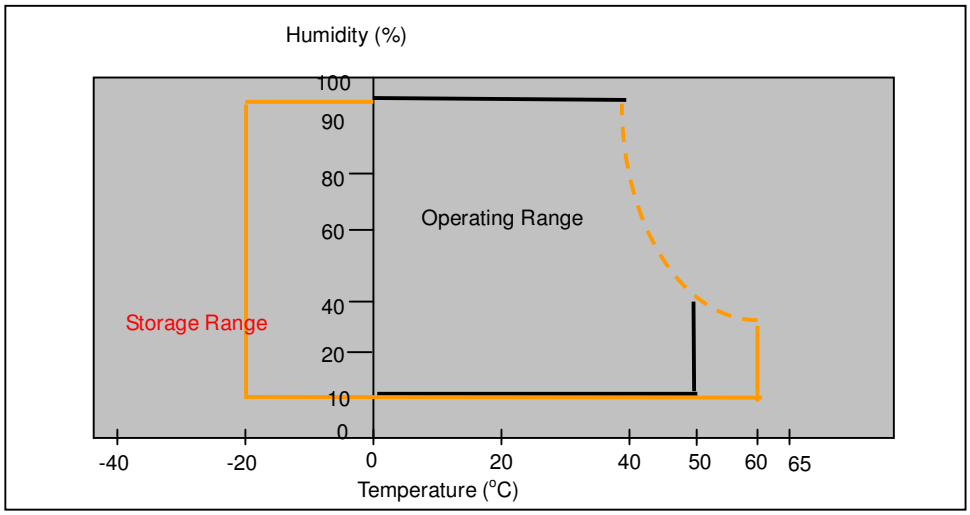
Item		Min.	Typ.	Max.	Unit
Module Size	Horizontal(H)	645	646	647	mm
	Vertical(V)	372.2	373	373.8	mm
	Depth(D)	50.7	51.5	52.3	mm
Weight (with inverter)		--	6000	--	g
Torque of customer screw hole		2.0	2.2	2,4	Kgf*Cm

2.0ABSOLUTE MAXIMUM RATINGS

2.0 Absolute Rating of Environment

Item	Symbol	Min.	Max.	Unit	Note
Storage temperature	T_{STG}	-20	60	°C	(1)
Operating temperature	T_{OPR}	0	50	°C	(1)
Vibration(non-operating)	V_{NOP}	--	2.0	G	(2)
Shock(non-operating)	S_{NOP}	--	50	G	(3)
Storage humidity	H_{STG}	10	90	%RH	(4)
Operating humidity	H_{OP}	10	80	%RH	(4)
Low pressure(operating)	P_{LOP}	697	--	HPa	(5)
Low pressure(non-operating)	P_{LNOP}	116	--	HPa	(6)

Note (1)Storage /Operating temperature



Temperature and humidity should be applied glass surface of a TFT module, not the system installed with a module.

(2) 5-500-5Hz sine wave, X,Y,Z each directions, 30 min/cycle.

(3) 11ms, ±X, ±Y, ±Z direction, one time each. For this shock test, It is necessary to fill the silicon rubber between the shock jig as buffer.

(4) Max wet bulb temp. =39°C

(5) 2 hrs. (10000 feet)

(6) 24hrs. (50000 feet)

2.2 Electrical Absolute Rating:

2.2.1 TFT LCD Module:

Item	Symbol	Min.	Max.	Unit.	Note
Power supply Voltage	V_{DD}	**0**	**13.2**	V	(1)(2)
Logic input voltage	V_{SIG}	-0.3	3.6	V	(1)(2)

2.2.2 Back Light Unit:

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Lamp voltage	V_L	1026	1140	**1254**	V(rms)	(1)(2)
Lamp current	I_L	4.5	5	5.5	mA	(1)(2)
Lamp frequency	f_L	52	56	60	KHz	(1)(2)

Note: (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under Normal Operating Conditions.

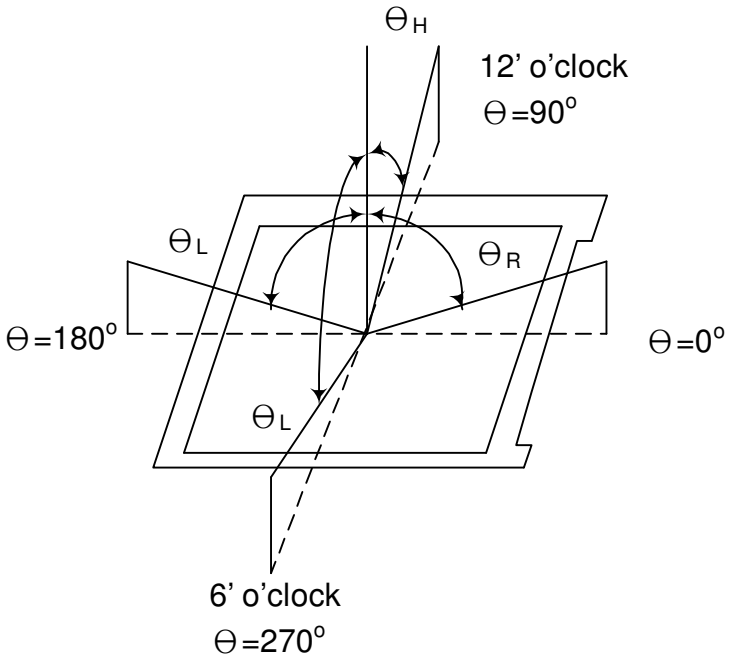
(2) Within Ta=25±2℃

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast		CR	$\Theta=0^o$ $\phi=0^o$ Normal viewing angle	360	600	--		(1)(2)
Response time		Tr +Tf		--	18	40	msec	(1)(3) black to white + white to black
White luminance (center of screen)		Y_L		400	550		cd/m^2	(1)(4)(5) (IL=5.0mA)
Color chromatically (CIE1931)	Red	Rx		0.61	0.64	0.67		(1)(4)
		Ry		0.29	0.32	0.35		
	Green	Gx		0.26	0.29	0.32		
		Gy		0.58	0.61	0.64		
	Blue	Bx		0.12	0.15	0.18		
		By		0.04	0.07	0.10		
	White	Wx		0.252	0.277	0.302		
		Wy		0.253	0.278	0.303		
Color Shift	Red	Rx				0.04		(1)(4)
		Ry				0.04		
	Green	Gx				0.04		
		Gy				0.04		
	Blue	Bx				0.04		
		By				0.04		
	White	Wx				0.04		
		Wy				0.04		
Viewing angle	Hor.	Θ_L	CR>10	--	85	--		
		Θ_R		--	85	--		
	Ver.	Θ_H		--	85	--		
		Θ_L		--	85	--		
Brightness uniformity		B_{UNI}	$\Theta=0^o$ $\phi=0^o$	--	--	25	%	(6)

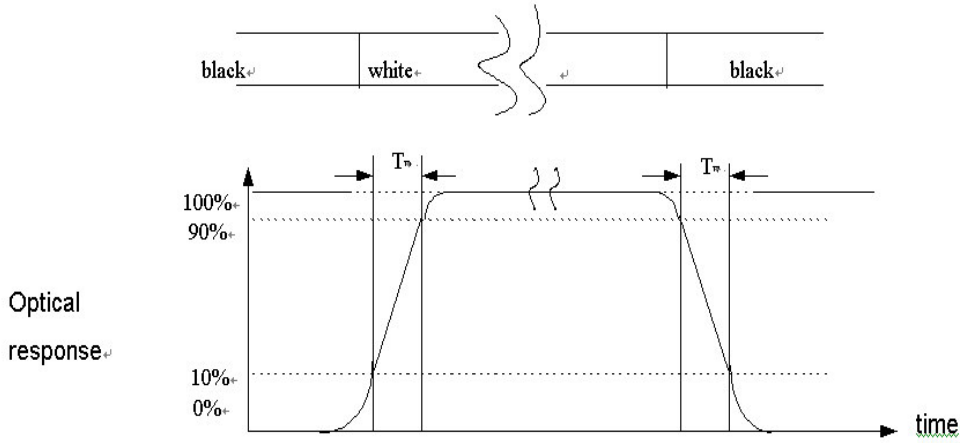
Note (1) Definition of Viewing Angle:



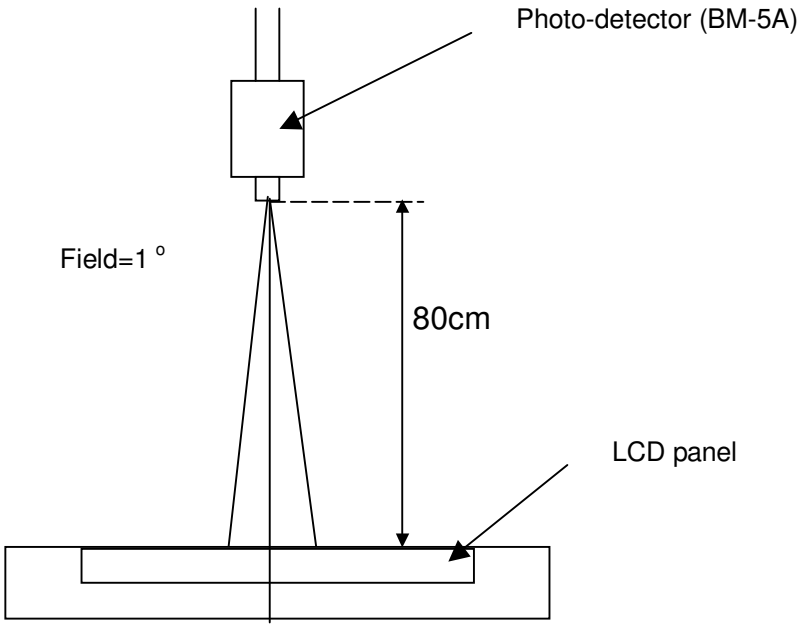
Note (2) Definition of Contrast Ratio (CR) :
Measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white (L255)}}{\text{Luminance with all pixels black (L0)}}$$

Note (3) Definition of Response Time: Sum of T_R and T_F

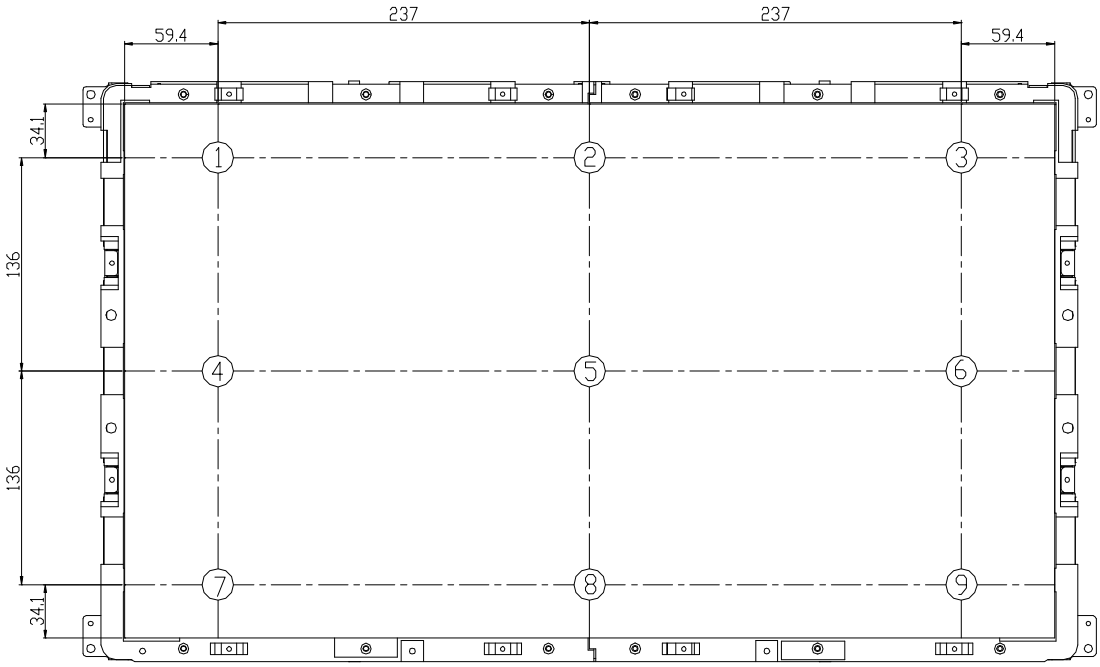


Note (4) Optical characteristic measurement setup



Note (5) Definition of Average Luminance of White (9Point)

$$\text{Average Luminance} = \frac{Y1+Y2+Y3+Y4+Y5+Y6+Y7+Y8+Y9}{9}$$



Note (6) Definition of brightness uniformity

$$\text{Luminance uniformity} = \frac{(\text{Max Luminance or Min Luminance})-(\text{Average Luminance})}{(\text{Average Luminance})} \times 100\%$$

Note (7) Definition of crosstalk CT (1) ~ CT (4)

$$CT(n) = \frac{|L(n) - LB(n)|}{L(n)} \times 100\% \text{ , } n = 1 \sim 4$$

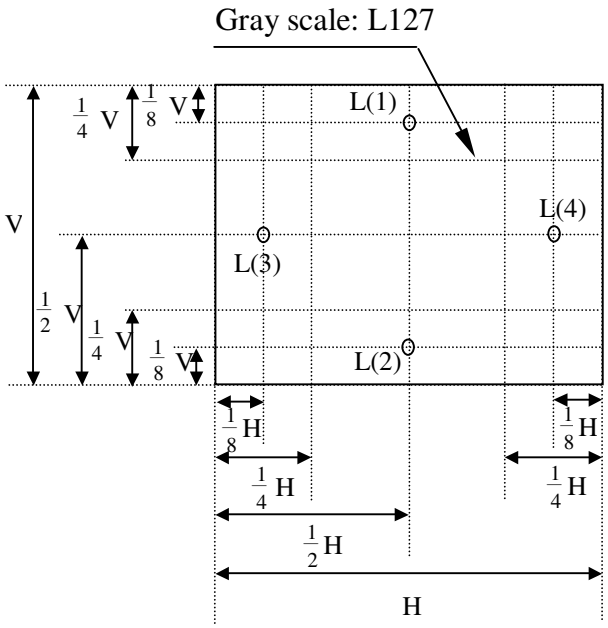
Where L(n) = Luminance of point "n" at pattern A (cd/m^2) , n=1～4

LB(n) = Luminance of point "n" at pattern B (cd/m^2) , n=1～4

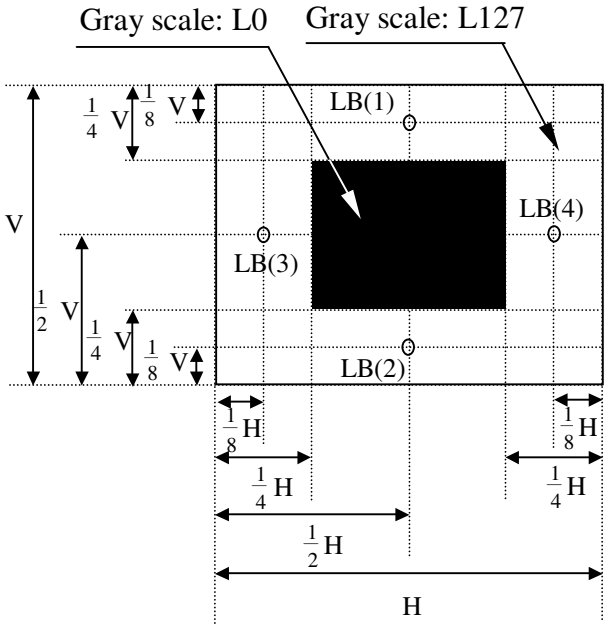
The location measured will be exactly the same in both patterns.

L0: Luminance with all pixels black

L255: Luminance with all pixels white



Pattern A



Pattern B

3.2 Measuring Condition

- Measuring surrounding : dark room
- Lamp current I_{BL} : 5±0.5mA, lamp freq. F_L=56 kHz , Inverter : HITACHI Aoume
- 6082800A01
- V_{DD1}=12V, f_V=60Hz, f_{DCLK}=85MHz
- Surrounding temperature : 25±2°C
- 90min. Warm-up time.BM-5A Light up 30min

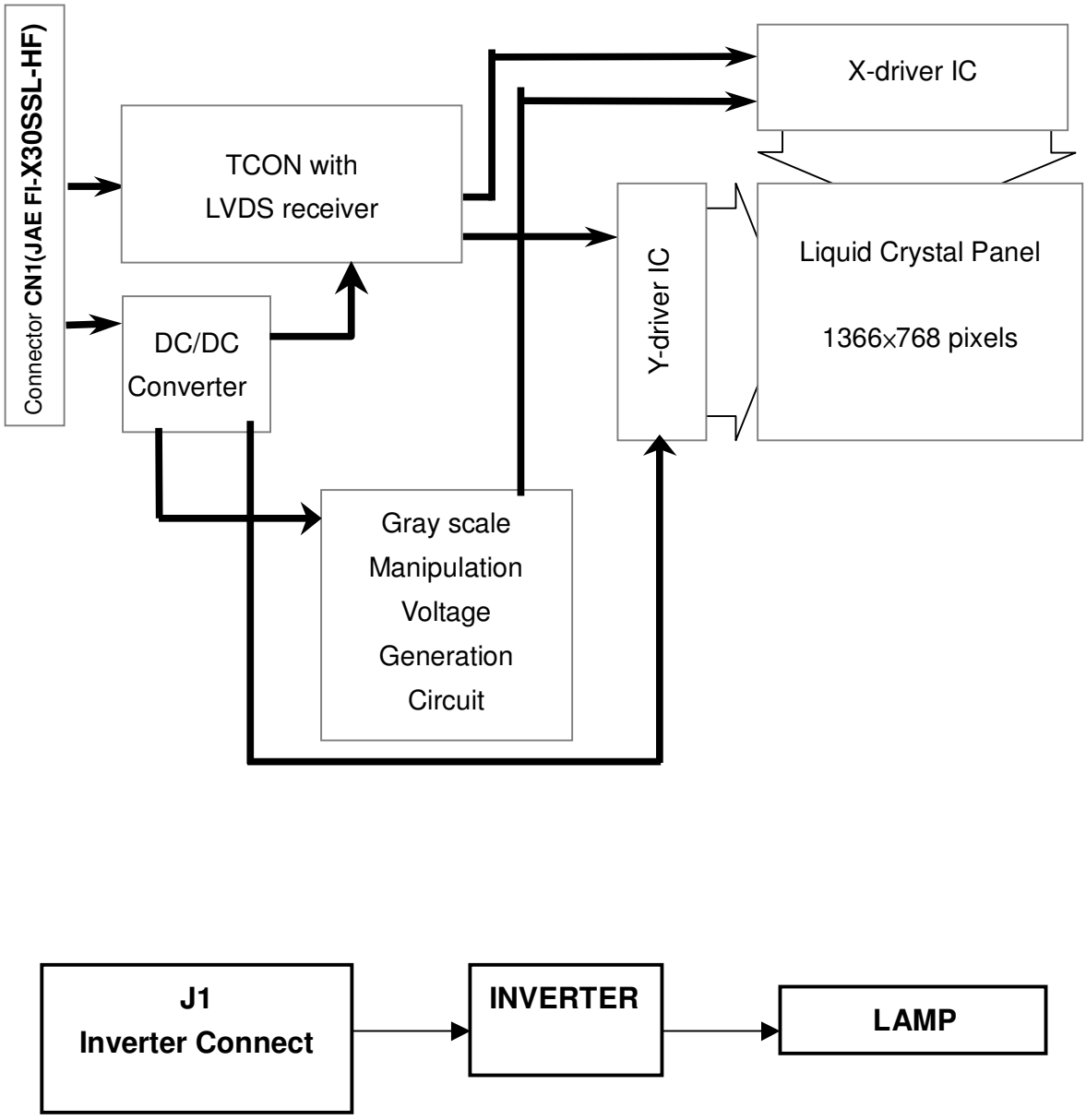
3.3 Measuring Equipment

BM-5A for optical characteristics.

- Measuring spot size : 10~12mm

4.0 BLOCK DIAGRAM

4.1 LCD Module Block Diagram:



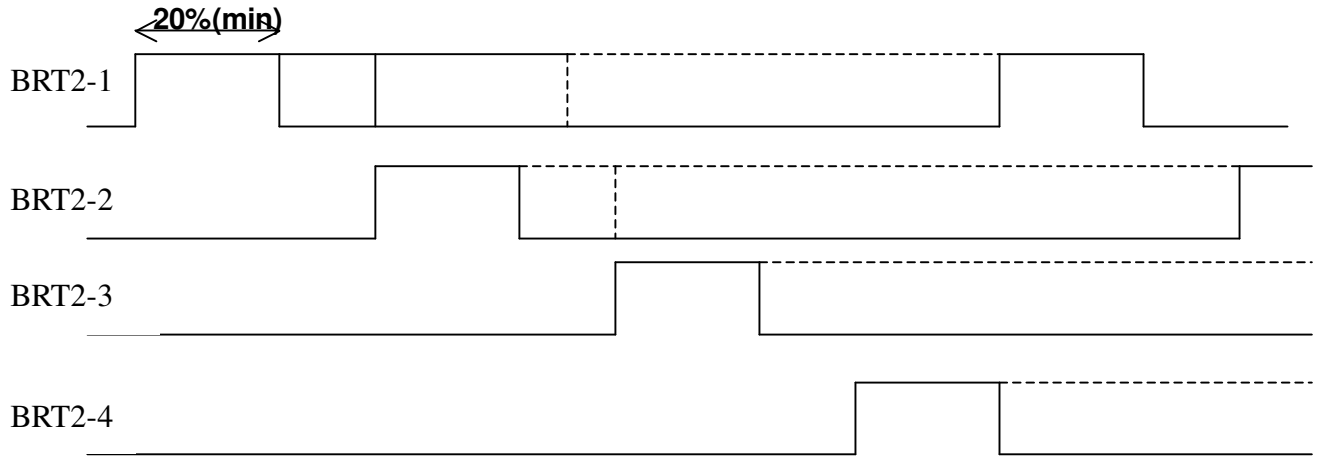
4.1.1 Input-Output Connector Pin Assign OF INVERTER

Mark	**CN2** S14B-PH-SM3-TB(JST) Connector Model	Pin No.	Signal name	Remark
CN2	S14B-PH-SM3-TB(JST)	1	VIN	24V Input Voltage
		2	VIN	24V Input Voltage
		3	VIN	24V Input Voltage
		4	VIN	24V Input Voltage
		5	VIN	24V Input Voltage
		6	GND	
		7	GND	
		8	GND	
		9	GND	
		10	GND	
		11	NC	Do not connect
		12	ON/OFF	Backlight on/off control
		13	BRT	Internal PWM control
		14	PWM ON/OFF	GND:internal PWM 3.3V:external PWM
CN3	S10B-PH-SM3-TB	1	GND	
		2	NC	Do not connect
		3	BRTCNT2_1	External PWM Brightness control Phase 1
		4	BRTCNT2_2	External PWM Brightness control Phase 2
		5	BRTCNT2_3	External PWM Brightness control Phase 3
		6	BRTCNT2_4	External PWM Brightness control Phase 4
		7	NC	Do not connect
		8	BRT CNT 1	Current Control(3.5 ~7.0mA)
		9	Output Error	Correct：3.3V、Error：0V
		10	NC	

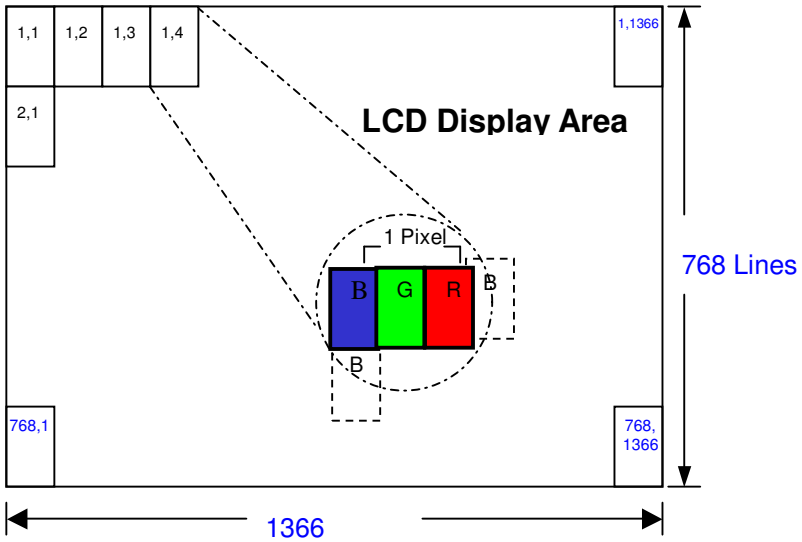
4.1.2 INVERTER CHARACTERISTICS

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Input Voltage	Vin	21.6	24	26.4	V	
CFL(turn ON)	ON/OFF	2.0	-	5.5	V	
CFL(turn OFF)	ON/OFF	-0.3	-	0.8	V	
Analog Dim Input Voltage	BRT CNT1	0	-	5	V	IL:3.5~7.0mA
	BRT CNT1	5.0		5.5	V	Current Brightness Control Max.
	BRT CNT1		0		mV	Current Brightness Control Min.
PWM Dim Input Duty	BRTCNT2_1~4	20	--	100	%	
PWM Dim Input Voltage	PWM"H"	3.0	3.3	5	V	BRTCNT2_1~4
	PWM"L"	0	--	1.0	V	
External PWM Dim Input Frequency	FP	50	300	360	Hz	4 blocks and 90 degrees phase shifted(NOTE 1)
Internal/external PWM Select Voltage(external input)	PWM ON/OFF	3.0	3.3	5	V	High:external input
Internal Dimming	PWM ON/OFF	-0.3	0	0.8	V	GND:PWM Internal Dimming lampCurrent:5Ma(Duty 100%)
Internal PWM Control Voltage	BRT	3.0		3.3	V	Internal PWM MAX.
	BRT		0		V	Internal PWM Min.
Efficiency	η	TBD	--	--	%	

NOTE 1



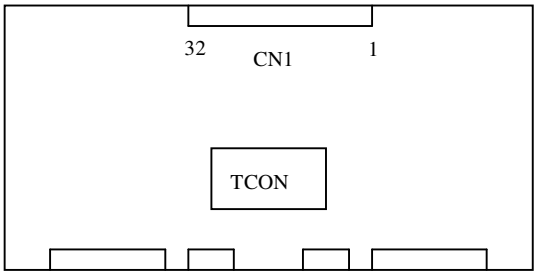
4.2 Pixel Format



4.3 Relationship between Displayed Color and Input Data

DISPLAY DATA / DISPLAY COLOR		R DATA								G DATA								B DATA							
		RA7	RA6	RA5	RA4	RA3	RA2	RA1	RA0	GA7	GA6	GA5	GA4	GA3	GA2	GA1	GA0	BA7	BA6	BA5	BA4	BA3	BA2	BA1	BA0
		RB7	RB6	RB5	RB4	RB3	RB2	RB1	RB0	GB7	GB6	GB5	GB4	GB3	GB2	GB1	GB0	BB7	BB6	BB5	BB4	BB3	BB2	BB1	BB0
		MSB							LSB	MSB							LSB	MSB							LSB
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RED	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	RED(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GREEN	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	GREEN(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	GREEN(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
BLUE	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	BLUE(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

5.0 I/O CONNECTION PIN ASSIGNMENT



5.1 Interface Connector

CN1(JAE FI-X30SSL-HF)

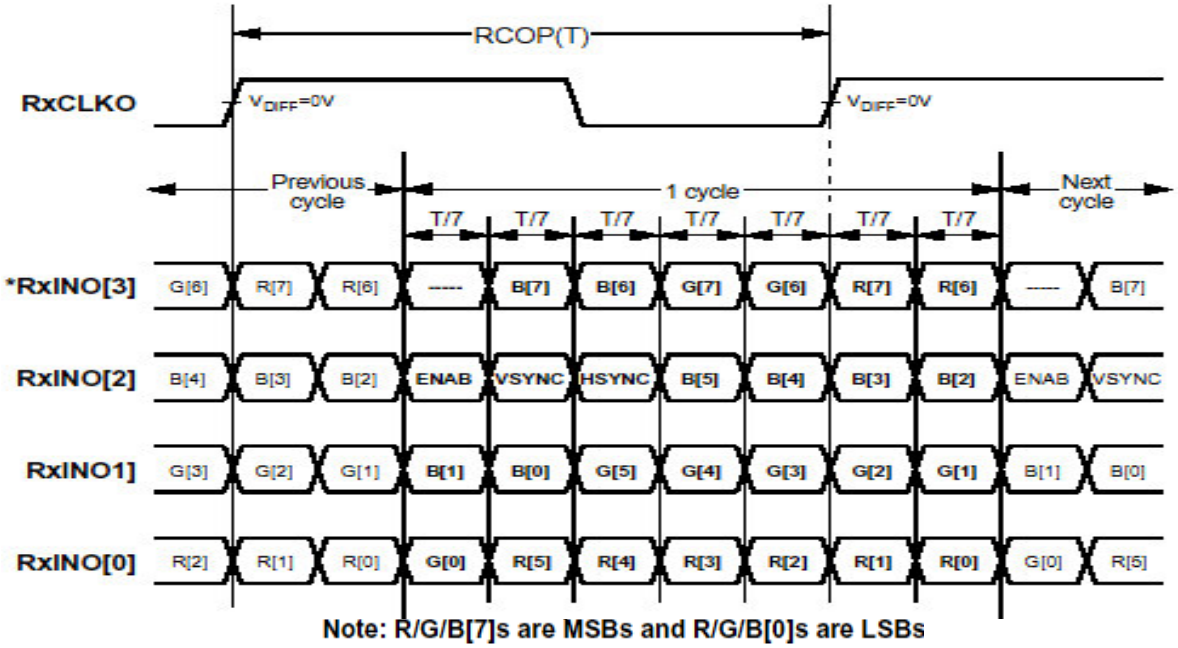
(Matching connector: JAE FI-X30C2L OR equivalent)

	I/F Connector	
Pin No.	**Symbol**	**Description**
1	VSS	Ground
2	VDD	Power Supply, 12v (typical)
3	VDD	Power Supply, 12v (typical)
4	VDD	Power Supply, 12v (typical)
5	VDD	Power Supply, 12v (typical)
6	VSS	Ground
7	VSS	Ground
8	VSS	Ground
9	VSS	Ground
10	LVDS-F.S.	0V/3.3V(Low or High) Reference Note:. 3
11	IC(OD)	0V/3.3V(Low or High，Low : OD On/High :OD Off)
12	VSS	Ground
13	Rin0-	Pixel Data
14	Rin0+	Pixel Data
15	VSS	Ground
16	Rin1-	Pixel Data
17	Rin1+	Pixel Data
18	VSS	Ground
19	Rin2-	Pixel Data
20	Rin2+	Pixel Data
21	VSS	Ground
22	ClkIN-	-LVDS differential clock input
23	ClkIN+	+LVDS differential clock input
24	VSS	Ground
25	Rin3-	Pixel Data
26	Rin3+	Pixel Data
27	VSS	Ground
28	NC	Reference Note:. 1
29	FSEL	0V/3.3V(Low or High，Low:60Hz/High:90Hz)
30	VSS	Ground
31	IC(Aline)	0V/3.3V(Low or High，Low: Aline OFF/High:Aline ON) Reference Note:. 2
32	VSS	Ground

Note:. 1.NC pin should be open ,Don't connect it to ground nor to other signal input.

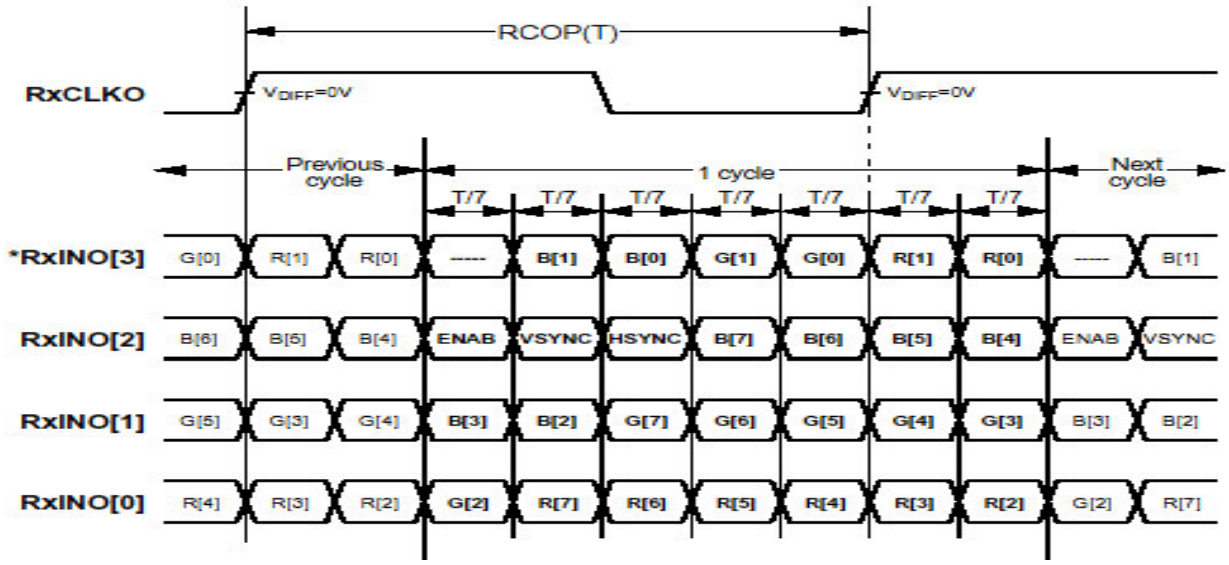
2.Aline:Black Line Insertion

LVDS Input Data Mapping 1 (Pin10 : LVDS-F.S.= "High")_



Note: R/G/B[7]s are MSBs and R/G/B[0]s are LSBs

LVDS Input Data Mapping 2 (Pin10 : LVDS-F.S.=Low)



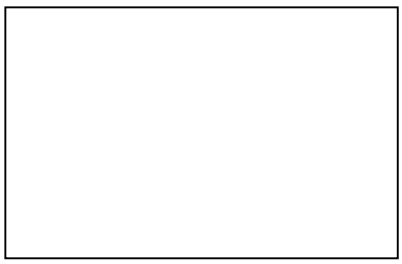
Note: R/G/B[7]s are MSBs and R/G/B[0]s are LSBs

6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module:

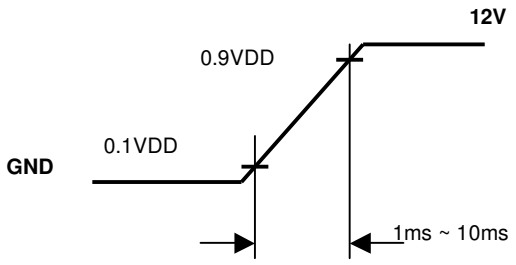
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of power supply		V_{DD}	10.8	12	13.2	V	
Current of power supply	White	I_{DD0}	(360)	(460)	(560)	mA	(1)(2)
Vsync frequency		f_V	58	60	62	Hz	
Hsync frequency		f_H	46.3	46.4	46.8	kHz	
Frequency		f_{DCLK}	78	85	87	MHz	
Input rush current		I_{RUSH}	---	---	2.0	A	(2)
LVDS skew margin		t_{RSKM}			500	psec	
LVDS Input Clock Jitter Tolerance			(TBD)		(TBD)	%	

Note (1) White:



Grey scale: L0～L255.
L0: Luminance with all pixels black.
L255: Luminance with all pixels white.

Note (2) Input Rush Current condition



6.2AC Electrical Characteristics:

6.2.1 Timing Parameters

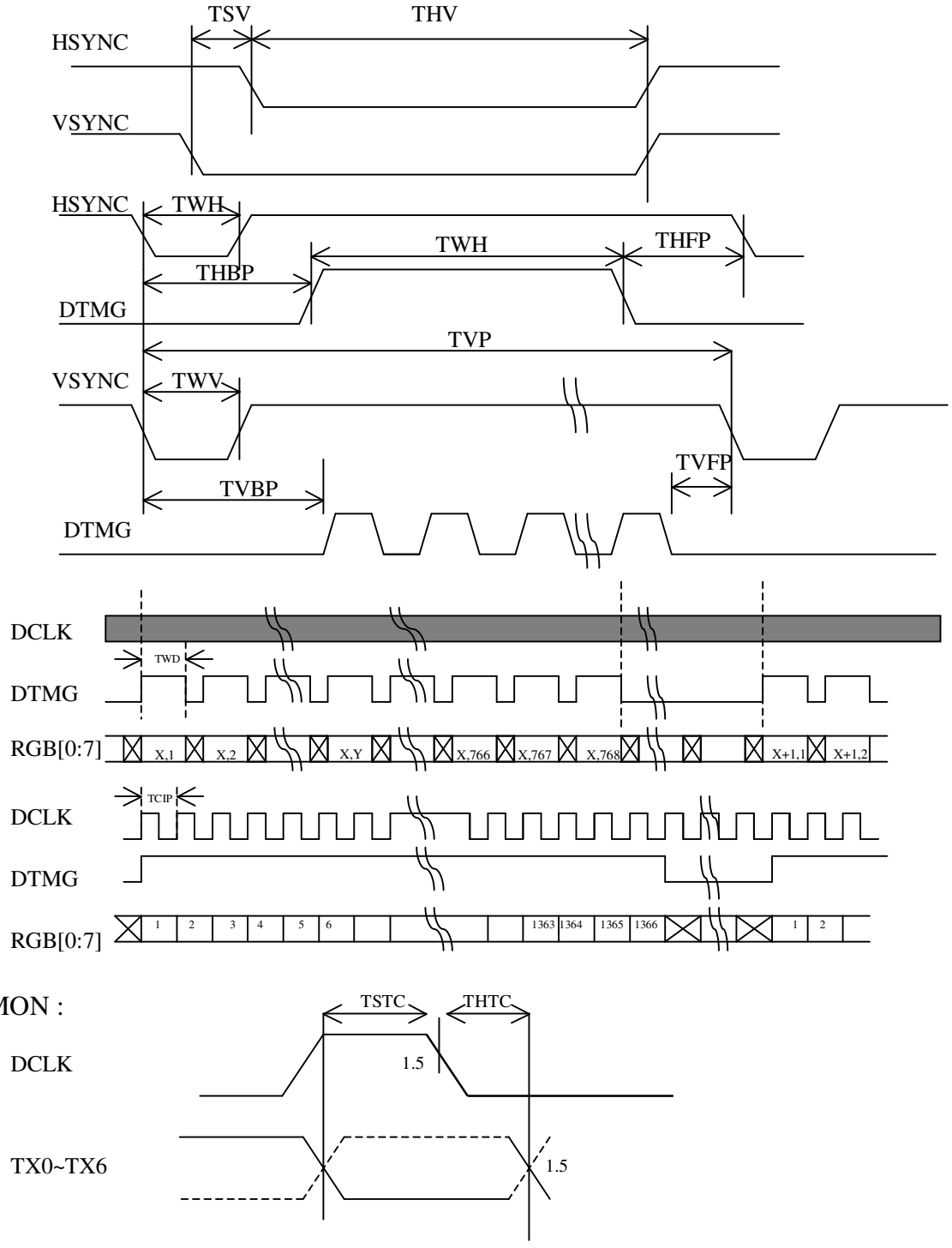
Item		Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	fCLK	78	85	87	MHz	
	Duty	D	0.35	0.5	0.65	-	D=TCIL/TCIP
HSYNC	Frequency	fH	46.3	46.4	46.8	kHz	
	Period	THP	1410	1833	2000	TCIP	
	Width-Active	TWH	8	-	240	TCIP	
VSYNC	Frequency	fV	58	60	62	Hz	
	Set up Time	TSV	0	-	-	TCIP	to HSYNC
	Hold Time	THV	8	-	-	TCIP	
	Period	TVP	772	773	780	THP	
	Width-Active	TWV	1	-	120	THP	
DTMG	Horizontal Back porch	THBP	16	-	-	TCIP	
	Horizontal Front Porch	THFP	0	-	-	TCIP	
	Vertical Back Porch	TVBP	2	-	1)	THP	
	Vertical Front porch	TVFP	2	-	1)	THP	
	Width-Active	TWD	1366	1366	1366	TCIP	
COMMON	Set up Time	TSTC	5	-	2)	ns	
	Hold Time	THTC	3	-	2)	ns	

Note 1) TVBP+TVFP ≥ 4

Note 2) TSTC and THTC values is LVDS driver timing spec.

6.2.2 Timing Diagram of Interface Signal

Timing chart



COMMON :

Note 1) THP=THBP+TWH+THFP

2) HSYNC , VSYNC input timing is negative polarity

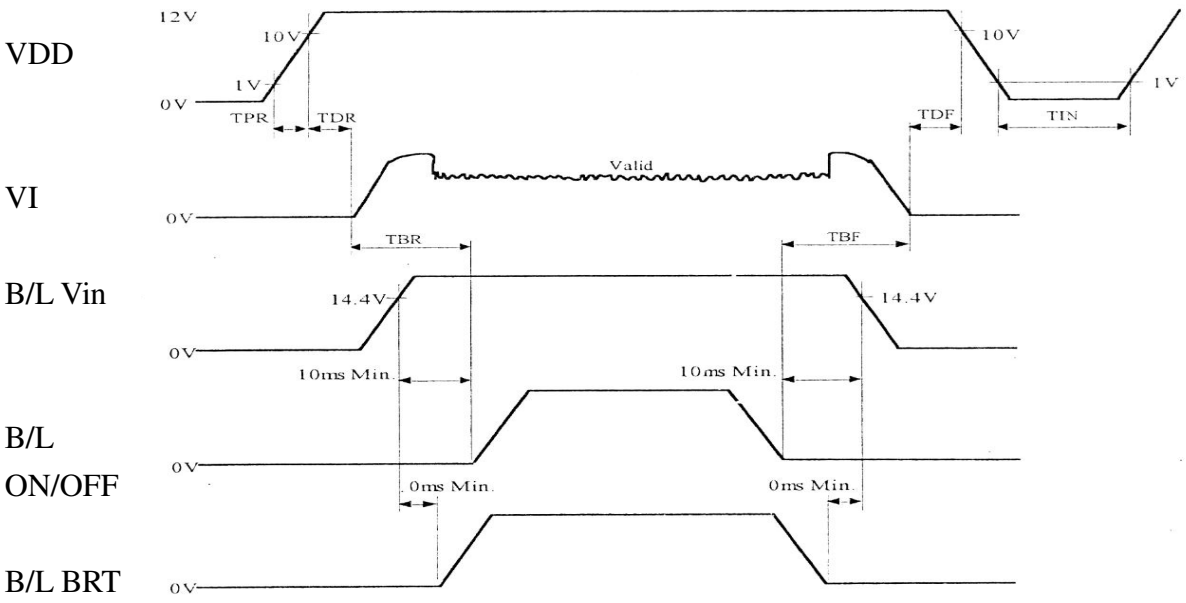
3) HSYNC in the blanking period is continuous.

4) TSTC and THTC are LVDS Driver specification.

5) This Timing specification about LVDS driver input signal are common base voltage~1.5V

VIH ≥2.0V , VIL ≤0.8V

Power between Input signal and Inverter Timing



0ms≤TPR≤10ms

10ms≤TDR≤50ms

0ms≤TDF≤50ms

TIN≥1s

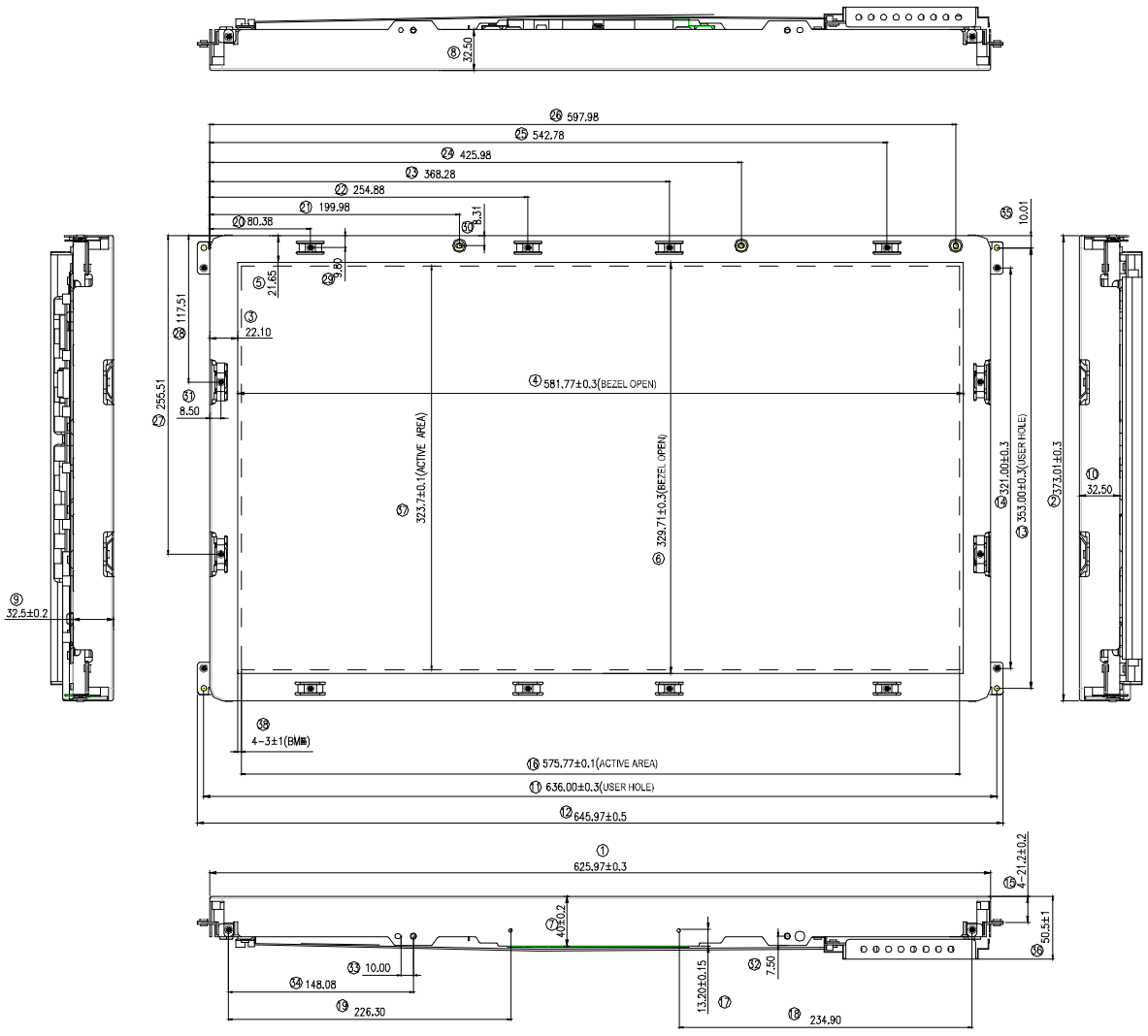
Note(1) Apply the lamp volatge within the LCD operation range. When the back-light turns on before the LCD operation or the LCD truns off before the back-light turns off. the display may momentarily become white.

(2) In case of V_{DD} = off level, please keep the level of input signal on 0 voltage.

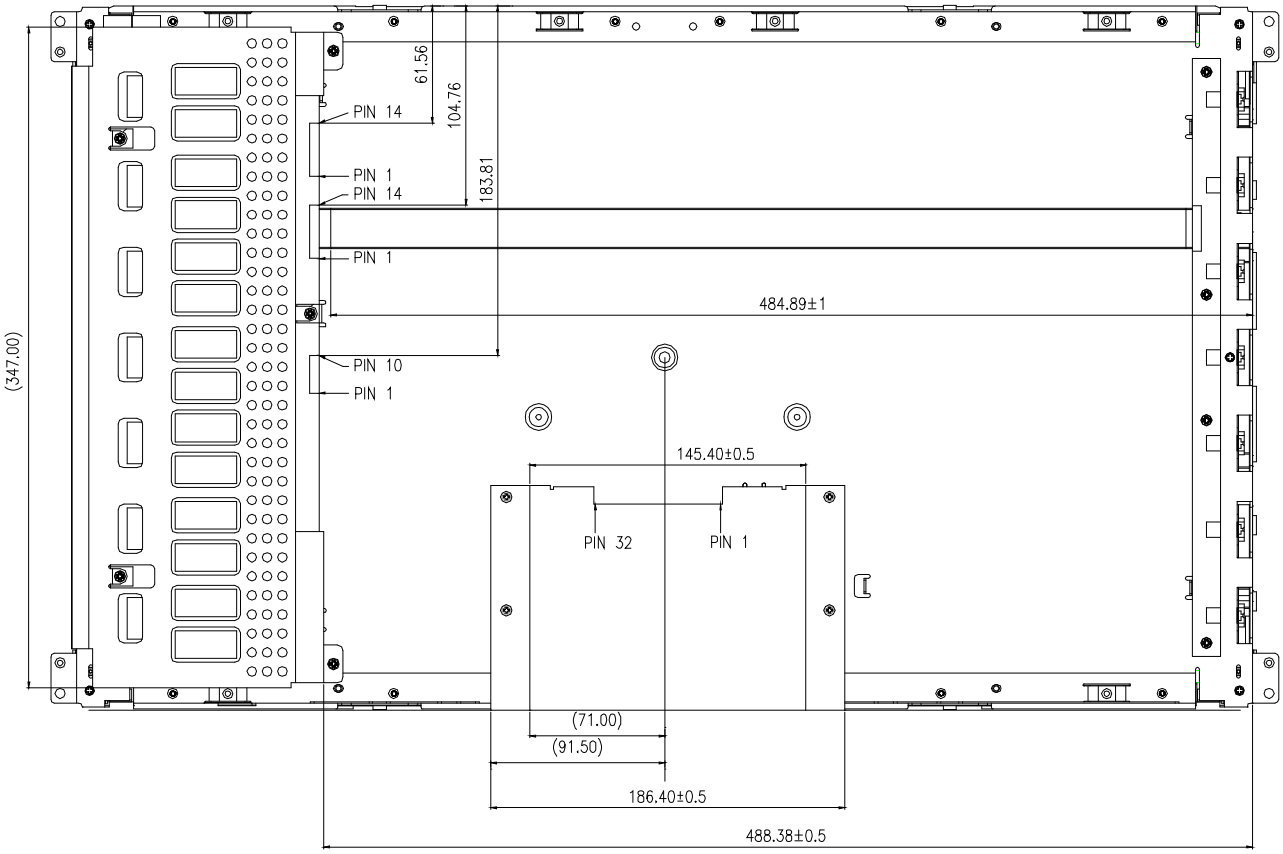
(3) TIN should be measured after the module has been fully discharged between power off and on period.

7.0 OUTLINE DIMENSION

7.1 Front View:

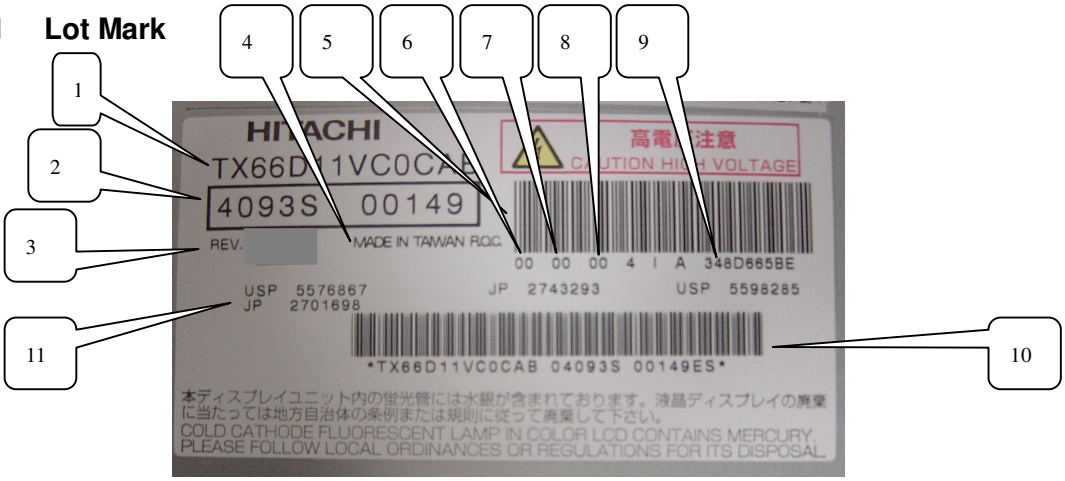


7.2 Back View:



8.0 LOT MARK

8.1 Lot Mark

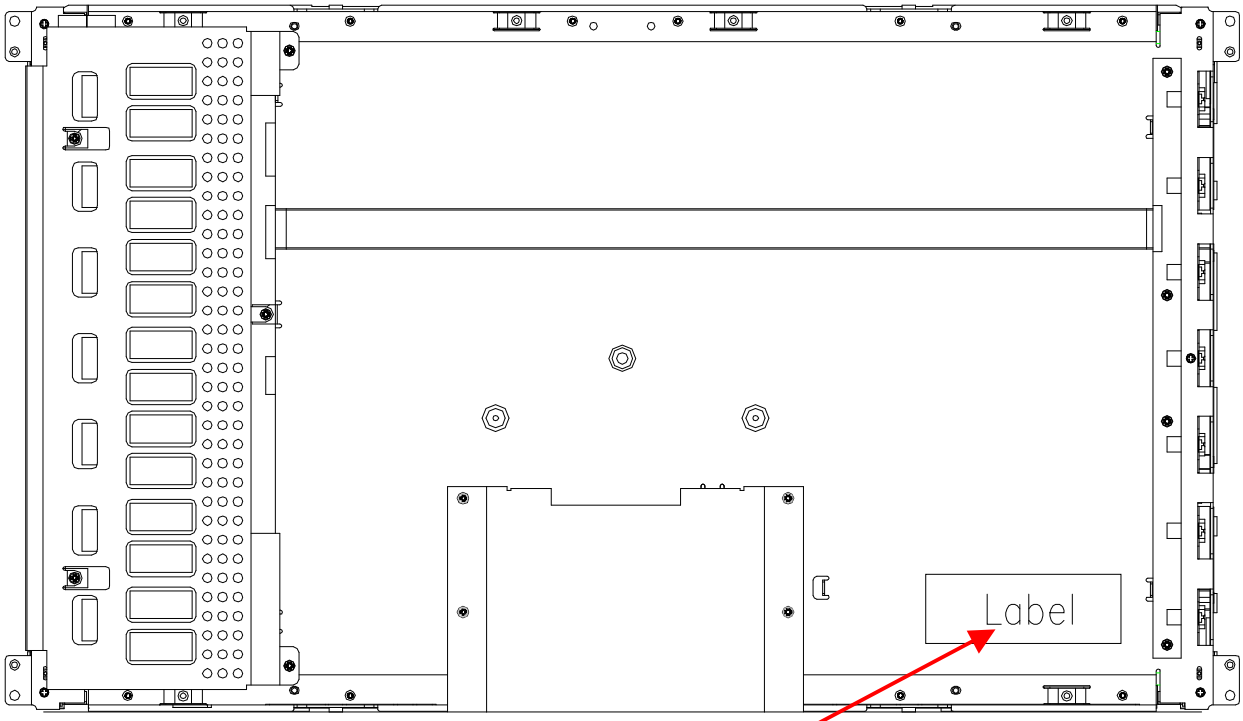


1.Model:TX66D11VCOCAB
2.4093S 00149
4→ Year of manufacturing: 2004
09→ Month of manufacturing
3→ Week of manufacturing
S→ Location of manufacturing
00149→ Serial No.
3.Design change version
4.Country the module made
5.Bar code
6.Series model ID.
7.Customer ID.
8.Product Status
9.LCD chip ID
10.EDID Data
11.Registered Pattern ID.

8.2 Location of Lot Mark

(1) The label is attached to the backside of the LCD module.

(2) This is subject to change without prior notice.



9.0 PACKAGE SPECIFICATION

9.1.packing form

(1)package quantity in one carton:16pieces

(2)carton size:1185*680*888

9.2.packing assembly drawings

LCD module

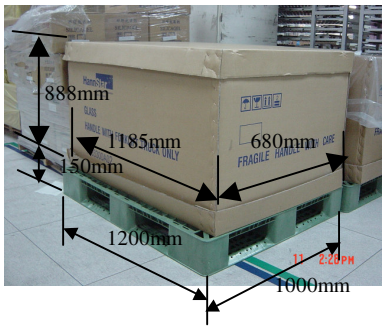
ESD bag

Put module into the packing case
T-CON close to the handle

Fold ESD bag

Fold the packing case

Put into carton
16 modules per carton



Dimension of carton and plastic parallel

10.0 GENERAL PRECAUTION

10.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life threatening or otherwise catastrophic.

10.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. HannStar does not warrant the module, if customers disassemble or modify the module.

10.3 Breakage of LCD Panel

10.3.1 If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquidcrystal, and do not contact liquid crystal with skin.

10.3.2 If liquid crystal contacts mouth or eyes, rinse out with water immediately.

10.3.3 If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

10.3.4 Handle carefully with chips of glass that may cause injury, when the glass is broken.

10.4 Electric Shock

10.4.1 Disconnect power supply before handling LCD module.

10.4.2 Do not pull or fold the CCFL cable.

10.4.3 Do not touch the parts inside LCD modules and the fluorescent lamp's connector or cables in order to prevent electric shock.

10.5 Absolute Maximum Ratings and Power Protection Circuit

10.5.1 Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.

10.5.2 Please do not leave LCD module in the environment of high humidity and high temperature for a long time.

10.5.3 It's recommended employing protection circuit for power supply.

10.6 Operation

10.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.

10.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.

10.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

10.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.

10.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzene or other adequate solvent.

10.7 Mechanism

Please mount LCD module by using mounting holes arranged in four corners tightly.

10.8 Static Electricity

10.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.

10.8.2 Because LCD module uses CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic ischarge.

10.8.3 Person who handle the module should be grounded through adequate methods.

10.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

10.10 Disposal

When disposing LCD module, obey the local environmental regulations.